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(54) Title: A CHEWING GUM HAVING PROLONGED SENSORY BENEFITS

(57) Abstract: Chewing gums and methods of making same that have prolonged and enhanced sensory benefits are provided. The chewing gums of the present invention include a hydrophobic sweetener, a sensorially active component or trigeminal stimulant, such as a flavor, in addition to other typical chewing gum ingredients. The hydrophobic sweeteners are composed of sweet organic compounds that have a low water solubility.

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CLAIMS:

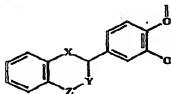
1. A chewing gum having prolonged sensory benefits comprising:

a water insoluble base portion;

a water soluble portion;

5 a sensorally active component; and

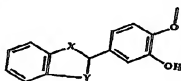
a hydrophobic sweetener having the formula selected from the group consisting of



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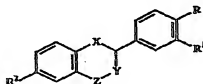
10 wherein X, Y and Z are selected from the group consisting of CH_2 , O

and S;



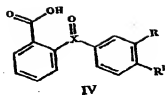
II

15 wherein X and Y are selected from the group consisting of S and O;

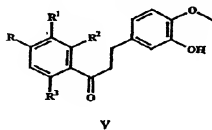


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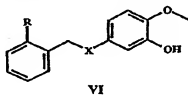
20 * wherein X is S or O; Y is O or CH_2 ; Z is CH_2 , SO_2 , or S;
R is OCH_3 , OH or H; R^1 is SH or OH and R^2 is H or OH;



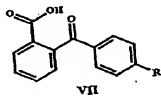
- 5 wherein X is C or S; R is OH or H and R¹ is OCH₃ or OH;



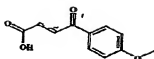
- 10 wherein R, R² and R³ are OH or H and R¹ is H or COOH;



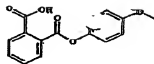
- 15 wherein X is O or CH₂ and R is COOH or H;



- 20 wherein R is CH₃, CH₂CH₃, OH, N(CH₃)₂ or Cl; and



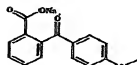
VIII



IX



X



XI

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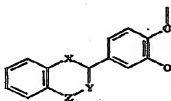
2. The chewing gum of claim 1 wherein the sensory benefits include flavor sensations, tingling, numbing, mouth coating, cooling/warming sensations, pain, itch or combinations thereof.

3. The chewing gum of claim 1 wherein the sensorially active component is selected from the group consisting of a flavor, a cooling agent, a tingling agent, Jambu extract, Vanillyl alkyl ethers, Vanillyl n-butyl ether, spilanthol, Echinacea extract, Northern Prickly Ash extract, capsaicin, capsicum oleoresin, red pepper oleoresin, black pepper oleoresin, piperine, ginger oleoresin, gingerol, shoagol, cinnamon oleoresin, cassia oleoresin, cinnamic aldehyde, eugenol, cyclic acetal of
15 vanillin, menthol glycerin ether, unsaturated amides and combinations thereof.

4. The chewing gum of claim 3 wherein the cooling agent is selected from the group consisting of menthol, WS3, N-substituted p-menthane carboxamide, acyclic carboxamides, WS23, menthyl lactate, Takasago Cooling agent, 3-1-menthoxypropane-1,2-diol, menthyl succinate, menthone glycerol ketals and mixtures
20 thereof.

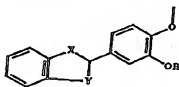
5. The chewing gum of claim 1 wherein the hydrophobic sweetener is in an amount ranging from about 50 Sucrose Equivalents to about 5000 Sucrose Equivalents.

6. A chewing gum having prolonged sensory benefits comprising a water
25 insoluble base portion; a water soluble portion; a flavor; a plurality of additional sensorially active components; and a hydrophobic sweetener wherein the hydrophobic sweetener has the formula selected from the group consisting of



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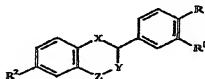
5 wherein X, Y and Z are selected from the group consisting of CH₂, O and S;



II

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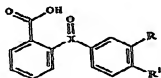
wherein X and Y are selected from the group consisting of S and O;



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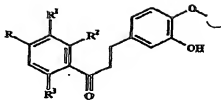
wherein X is S or O; Y is O or CH₂; Z is CH₂, SO₂ or S;
R is OCH₃, OH or H; R¹ is SH or OH and R² is H or OH;



IV

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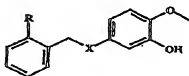
wherein X is C or S; R is OH or H; R¹ is OCH₃; or OH;



V

wherein, R, R² and R³ are OH or H and R¹ is H or COOH;

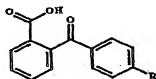
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VI

wherein X is O or CH₂; and R is COOH or H;

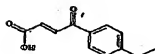
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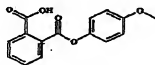
VII

wherein R is CH₃, CH₂CH₃, OH, N(CH₃)₂ or Cl; and

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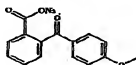
VIII



IX



X



XI

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7. The chewing gum of claim 6 wherein the additional sensorally active components are selected from the group consisting of a cooling agent, menthol, WS3, N-substituted p-menthane carboxamide, acyclic carboxamides, WS23, menthyl lactate, Takasago Cooling agent, 3-1-menthoxypropane-1,2-diol, menthyl succinate, menthone glycerol ketals, a tingling agent, Jambu extract, Vanillyl alkyl ethers, Vanillyl n-butyl ether, spilanthol, Echinacea extract, Northern Prickly Ash extract, capsaicin, capsicum oleoresin, red pepper oleoresin, black pepper oleoresin, piperine, ginger oleoresin, gingerol, shogaol, cinnamon oleoresin, cassia oleoresin, cinnamic aldehyde, eugenol, cyclic acetal of vanillin, menthol glycerin ether, unsaturated amides and combinations thereof.

8. A method of producing a chewing gum exhibiting prolonged trigeminal effects comprising the steps of:

providing a plurality of chewing gum ingredients including a water insoluble base portion, a water soluble portion, a trigeminal stimulant and a hydrophobic sweetener;

processing the ingredients; and

forming the chewing gum.

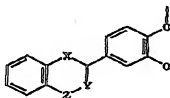
9. The method of claim 8 wherein the hydrophobic sweetener is in an amount ranging from about 50 Sucrose Equivalents to about 5000 Sucrose Equivalents.

10. The method of claim 8 wherein the ingredients are processed by pre-mixing the hydrophobic sweetener with the trigeminal stimulant.

11. The method of claim 8 wherein the trigeminal stimulant is selected from the group consisting of a flavor, a cooling agent, menthol, WS3, N-substituted p-menthane carboxamide, acyclic carboxamides, WS23, menthyl lactate, Takasago Cooling agent, 3-1-menthoxypropane-1,2-diol, menthyl succinate, menthone glycerol ketals, a tingling agent, Jambu extract, Vanillyl alkyl ethers, Vanillyl n-butyl ether,

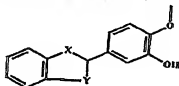
spilanthal, Echinacea extract, Northern Prickly Ash extract, capsaicin, capsicum oleoresin, red pepper oleoresin, black pepper oleoresin, piperine, ginger oleoresin, gingerol, shogaol, cinnamon oleoresin, cassia oleoresin, cinnamic aldehyde, eugenol, cyclic acetal of vanillin, menthol glycerin ether, unsaturated amides and combinations thereof.

12. The method of claim 8 wherein the hydrophobic sweetener has a formula selected from the group consisting of:



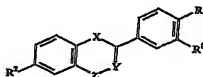
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wherein X, Y and Z are CH_2 , O or S;



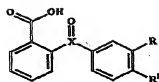
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wherein X and Y are S or O;



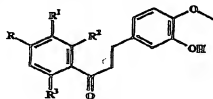
III

wherein X is S or O; Y is O or CH_2 ; Z is CH_2 , SO_2 , or S; R is OCH_3 , OH or H; R^1 is SH or OH and R^2 is H or OH;



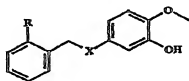
IV

5 wherein X is C or S; R is OH or H; R¹ is OCH₃; or OH;



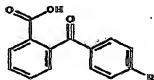
V

10 wherein, R, R² and R³ are OH or H and R¹ is H or COOH;



VI

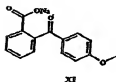
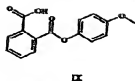
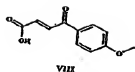
15 wherein X is O or CH₂; and R is COOH or H;



VII

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wherein R is CH₃, CF₃CH₃, OH, N(CH₃)₂ or Cl; and



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13. A method for prolonging sensory benefits of a chewing gum comprising the step of chewing the chewing gum which includes a water insoluble base portion, a water soluble portion, a trigeminal stimulant and a hydrophobic
10 sweetener including a sweet organic compound.

14. The method of claim 13 wherein the trigeminal stimulant is selected from the group consisting of a flavor, a cooling agent, menthol, WS3, N-substituted p-menthane carboxamide, acyclic carboxamides, WS23, menthyl lactate, Takasago
15 Cooling agent, 3-1-menthoxypropane-1,2-diol, menthyl succinate, menthone glycerol ketals, a tingling agent, Jambu extract, Vanillyl alkyl ethers, Vanillyl n-butyl ether, spilanthal, Echinacea extract, Northern Prickly Ash extract, capsaicin, capsaicin oleoresin; red pepper oleoresin, black pepper oleoresin, piperine, ginger oleoresin, gingerol, shogaol, cinnamon oleoresin, cassia oleoresin, cinnamic aldehyde, eugenol,
20 cyclic acetal of vanillin, menthol glycerin ether, unsaturated amides and combinations thereof.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US02/15862

A. CLASSIFICATION OF SUBJECT MATTER IPC(7) A 23 G 3/30 US CL 426/3 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : 426/3 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched NONE Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) NONE		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 4,013,801 A (DAWSON et al) 22 March 1977 (22.03.77), see entire document.	1-3, 8, 10-14 4-7, 9
X --- Y	US 3,857,962 A (WESTALL et al) 2/ December 1974 (31.12.74), see entire document.	1-3, 8, 10-14 4-7, 9
X --- Y	US 3,821,417 A (WESTALL et al) 28 June 1974 (28.06.74), see entire document.	1-3, 8, 10-14 4-7, 9
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "Z" document member of the same patent family		
Date of the actual completion of the international search 16 AUGUST 2002		Date of mailing of the international search report 17 SEP 2002
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US02/18862

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 5,236,721 A (CHU et al) 17 August 1993 (17.08.93), see entire document.	8, 10, 11, 13, 14 9